

COUNTS OF MARABOU STORKS *LEPTOPTILOS CRUMENIFERUS* IN RELATION
TO THEIR MOVEMENTS IN EASTERN AFRICA

D. E. Pomeroy

INTRODUCTION

During the early years of the twentieth century the Marabou Stork was rare in eastern Africa, occurring in small numbers at well-scattered localities (Pomeroy 1977a). Today Marabous are more numerous and are sometimes seen in large flocks. These assemblages are not usually associated with nesting colonies and often occur outside the breeding season. Regular counts have been made at several feeding sites in eastern Africa and, in addition, there are a number of isolated records of concentrations of Marabous within the area. Both types of record contribute to an understanding of the movements of the species, which are probably quite extensive (Pomeroy 1978).

For convenience, the records are divided into those relating firstly, to short-term sources of food, and secondly to regular feeding sites, where birds are present for lengthy periods, sometimes throughout the year.

COUNTS OF MARABOUS

Short-term assemblages of Marabous The natural food of the Marabou consists largely of carrion. This is often widely-dispersed. Only rarely does an abundance of natural food occur at one place but when it does, large numbers of Marabous may be attracted, usually accompanied by other scavengers. Sometimes the food source results from a catastrophe, as when some 3000 wildebeest *Connochaetes taurinus* calves were drowned or lost at Lake Ndutu, Serengeti National Park*, in 1973 (D.A. Kreulen pers. comm.). Numerous scavengers were attracted, amongst which were well over 100 Marabous. In 1906, Meinertzhagen (1957) counted more than 350 Marabous near Muhoroni in western Kenya, where many cattle were dying. More often, however, the food source is insects. For example, K. Modha (pers. comm.) reported several hundred Marabous at Ishasha, Rwenzori National Park, on 22 March 1971, feeding on the army-worm caterpillar *Spodoptera exempta*. The Marabous were accompanied by 100 - 200 Abdim's Storks *Sphenorhynchus abdimii* and some Black Kites *Milvus migrans*. Three days later the birds had left. Army-worm were also the prey of 300 - 400 Marabous at Kimottoro in northern Tanzania on 17 February 1977 (D.D. Peterson, pers. comm.). R. Wooff (pers. comm.) reported very large numbers of Marabous feeding on grasshoppers in northern Karamoja during January 1970. De-alate termites, especially the larger members of the genera *Macrotermes* and *Hodotermes*, attract many species of birds, and I have twice seen parties of up to 100 Marabous feeding on these insects.

Marabous at long-term food sources Some large lakes, such as Abiata in Ethiopia and Nakuru in Kenya, support Marabous for most of the year (although for Nakuru there are no actual counts). These birds probably derive some food from natural sources, especially when lake levels are falling. Occasionally, large locust swarms occur and may provide a long-term source of natural food, as happened at Lake Rukwa, Tanzania, in 1959

* see Appendix 2 for details of localities.

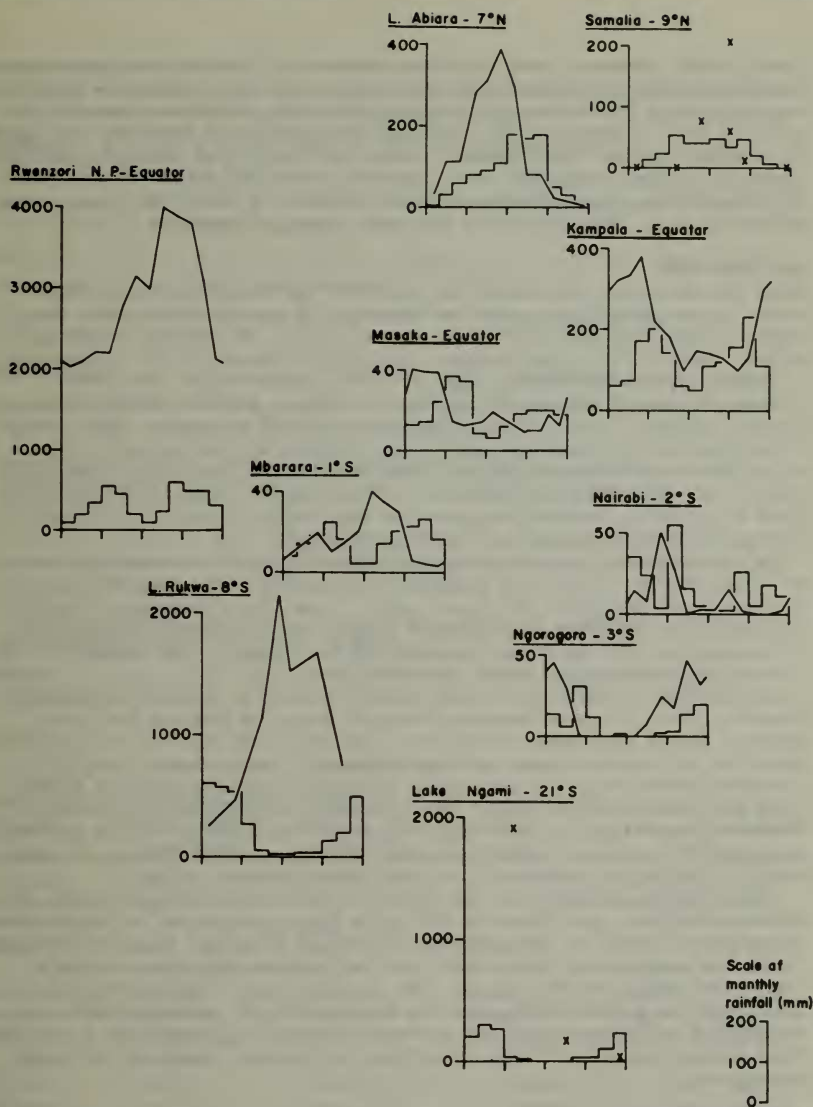


Fig. 1 Numbers of Marabous at various sites in eastern Africa, arranged geographically. Solid lines and crosses: numbers of birds, scale on vertical axes (note differing scales). Months, beginning with January, are on the horizontal axes. The histograms show rainfall. Appendix 1 gives the sources of the data

(Dean 1964). However, most long-term sources of food are such places as abattoirs, refuse tips and fish-processing factories, where the food supply results from human activities. In Uganda, there were some 15 to 20 such sites (Pomeroy 1973), although the numbers of Marabous were small in all but four of them. Figure 1 shows the results of regular counts at these four sites, together with six other sites in eastern Africa, four of them having counts which continued for about a year. The figure also shows rainfall. The sources of the data appear in Appendix 1.

DISCUSSION

With the exception of Somalia and the four Ugandan sites, all counts refer to one particular year (see Appendix 1) and in other years the patterns may have been different. Nevertheless, the Ugandan counts showed rather little year-to-year variation (Pomeroy 1977a), suggesting a regularity which probably applied to all sites except Lake Rukwa.

Numbers changed seasonally at all localities, and the changes were proportionately large, clearly implying seasonal movements. Often, the increases and decreases persisted for several consecutive months. From this, and from occasional direct observations, it appears that Marabous migrate as individuals or in small parties, rather than in large flocks. This is probably because they have to feed whilst migrating, and most sources of food are small and widely scattered.

In wetter areas, Marabous were most numerous during or towards the end of a dry season. Often they departed as rainfall increased. At the extreme north and south of their range - Somalia and Botswana - rainfall is lower, and Marabous were present during the wet season. Under these circumstances rain tends to increase the food supply, the reverse of the situation in the wetter areas (Pomeroy 1978).

The numbers of birds at various sites can also be related to nesting seasons. Thus, birds in Rwenzori National Park, at Mbarara and Lake Abiata, and at the Somali localities, probably came from nesting colonies north of the equator where nesting is mainly from November to April (Pomeroy 1978). Those at most other localities are likely to be birds from more southerly colonies, where nesting is mainly between June and November. The birds at Lake Rukwa may also have belonged to the northern population; it seems likely that many of them were sub-adults, as were many of the birds in Rwenzori National Park (Pomeroy 1977a).

The breeding population of Marabous in Uganda apparently doubled between 1967 and 1976 (Pomeroy 1977b). A large proportion of the Marabous in Uganda is found at food sources associated with man (Pomeroy 1973) and these are mostly more accessible than the nesting colonies. Counts at long-term feeding sites thus provide a useful way of monitoring the population as a whole. Elsewhere in eastern Africa, natural foods are relatively more important, but numbers of birds at places with a regular food supply are still likely to reflect the general level of the local population.

ACKNOWLEDGEMENTS

I am most grateful to all those who supplied me with unpublished data, to S. Mwaura who drew the Figure, and to A.W. Diamond, D.J. Pearson and G.C. Backhurst for their comments.

REFERENCES

- ARCHER, G. & GODMAN, E.M. 1937. *The birds of British Somaliland and the Gulf of Aden*. 2 vols. London: Gurney & Jackson.
- BANNERMAN, D.A. 1953. *The birds of west and equatorial Africa*. 2 vols. Edinburgh: Oliver & Boyd.
- BENSON, C.W., BROOKE, R.K., DOWSETT, R.J. & IRWIN, M.P.S. 1973. *The birds of Zambia*. 2nd edition. London: Collins.
- DEAN, G.J.W. 1964. Stork and egret as predators of the red locust in the Rukwa valley outbreak area. *Ostrich* 35: 95-100.
- JACKSON, S.P. 1961. *Climatological atlas of Africa*. Lagos & Nairobi: CCTA/CSA.
- MEINERTZHAGEN, R. 1957. *Kenya diary 1902-1906*. Edinburgh: Oliver & Boyd.
- POMEROY, D.E. 1973. The distribution and abundance of Marabou storks in Uganda. *East African Wildlife Journal* 11: 227-240.
- 1977a. The biology of Marabou storks in Uganda. I. Some characteristics of the species, and the population-structure. *Ardea* 65: 1-24.
- 1977b. Marabou storks *Leptoptilos crumeniferus* breeding colonies in Uganda. *Journal of the East Africa Natural History Society & National Museum* 161: 1-11.
- 1978. Seasonality of Marabou Storks *Leptoptilos crumeniferus* in eastern Africa. *Ibis* 120: 313-321.
- PROZESKY, O.P.M. 1970. *A field guide to the birds of southern Africa*. London: Collins.

APPENDICES

1. Sources of data used in Figure 1

Locality	Main food of Marabous	Period of observation	Author	Source of rainfall data
Somalia	Refuse	1955-6, 68	G. Clarke ¹	Jackson (1961)
L. Abiata	Fish	Oct 1964- June 1966	E.K. Urban ¹	Jackson (1961)
Rwenzori N.P.	Fish factories and villages	1970-72	Pomeroy ²	<i>Atlas of Uganda</i>
Mbarara	Refuse	1970-72	Pomeroy ³	<i>Atlas of Uganda</i>
Masaka	Abattoir	1970-72	Pomeroy ³	<i>Atlas of Uganda</i>
Kampala	Refuse and abattoir	1970-72	Pomeroy ²	<i>Atlas of Uganda</i>
Nairobi	Abattoir	Feb-Nov 1973	R. Newson ¹	E.A. Met. Dept.*
Ngorongoro	Carrion	June 1973- March 1974	G. Frame ¹	E.A. Met. Dept.*
L. Rukwa	Locusts	Jan-Nov 1959	Dean (1964)	E.A. Met. Dept.*
L. Ngami	Various	Dec 1970- Aug 1971	R.D. Jacka ¹	Jackson (1961)

¹ = pers. comm.; ² = Pomeroy (1977a); ³ = Pomeroy (unpublished); * = rainfall figures refer to the period of observation, in all others long-term averages were used.

2. Exact localities of places mentioned in the text and Appendix 1

Somalia	Hargeisa (9°33'N., 44°04'E.) and several smaller towns within a 100-km radius	
Ethiopia	Lake Abiata	7°30'N., 38°20'E.
Uganda	Rwenzori National Park	0°20'S., 29°50'E.
	Ishasha	0°30'S., 29°40'E.
	Mbarara	0°40'S., 30°40'E.
	Masaka	0°25'S., 31°45'E.
	Kampala	0°20'N., 32°35'E.
Kenya	Karamoja	3°40'N., 44°E.
	Muhoroni	1°20'S., 36°40'E.
	Nairobi (Ngong)	1°20'S., 36°40'E.
Tanzania	Lake Ndutu (Lagaja)	3°S., 35°E.
	Lake Rukwa	8°S., 32°E.
	Kimottoro	4°28'S., 36°20'E.
	Ngorongoro	3°30'S., 36°00'E.
Botswana	Lake Ngami	20°40'S., 22°30'E.

D.E. Pomeroy, Department of Zoology, Kenyatta University College, Box 43844, Nairobi.

(Received 2 December 1978)